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Dillon Reservoir
Summit County, Colorado

National Eutrophication Survey, Corvallis, Oreg

Prepared for

Corvallis Environmental Research Lab, Oreg

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NATIONAL EUTROPHICATION SURVEY

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16. ABSTRACT

Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
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REPORT
ON
DILLON RESERVOIR
SUMMIT COUNTY
COLORADO

EPA REGION VIII

WORKING PAPER No. 769

WITH THE COOPERATION OF THE

COLORADO DEPARTMENT OF HEALTH

AND THE

COLORADO NATIONAL GUARD

JULY, 1977

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FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGEMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U. S. Environmental Protection Agency) expresses sincere appreciation to the Colorado Department of Health for professional involvement, to the Colorado National Guard for conducting the tributary sampling phase of the Survey, and to those wastewater treatment plant operators who voluntarily provided effluent samples.

The staff of the Water Quality Control Division provided invaluable lake documentation and counsel during the Survey, reviewed the preliminary reports, and provided critiques most useful in the preparation of this Working Paper series.

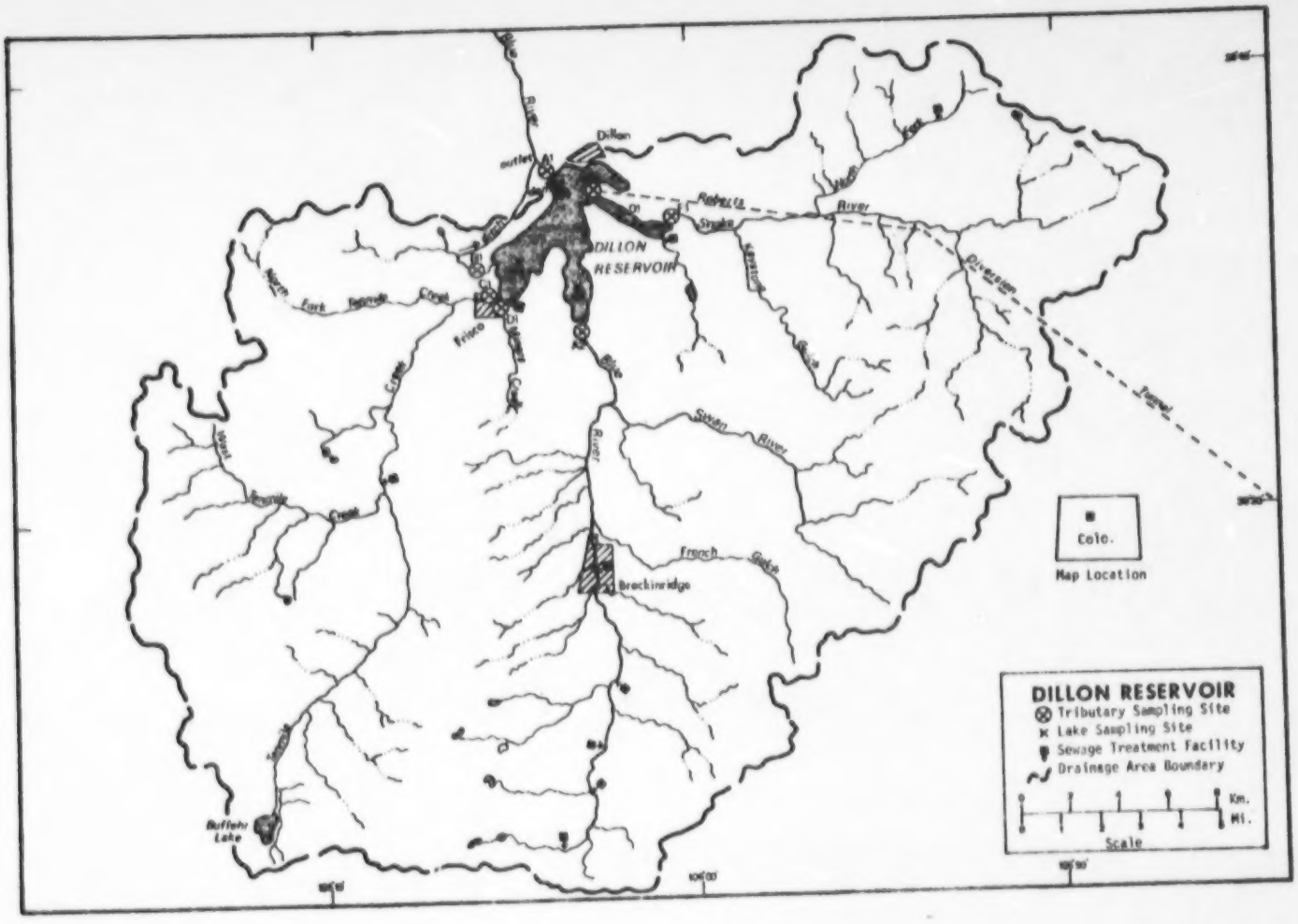
Lt. Colonel Paul A. Parsons, the Deputy Adjutant General of Colorado, and Project Officer Colonel Hershel C. Yeargan, who directed the volunteer efforts of the Colorado National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY LAKES AND RESERVOIRS

STATE OF COLORADO

NAME	COUNTY
Barker	Boulder
Barr	Adams
Blue Mesa	Boulder
Cherry Creek	Arapohoe
Cucharas	Huerfano
Dillon	Summit
Grand	Grand
Green Mountain	Summit
Holbrook	Otero
Meredith	Crowley
Milton	Weld
Navajo	Archuleta, CO; San Juan, Rio Arriba, NM
Shadow Mountain	Grand


Blue River
Dillon
outlet
Roberts
Tunnel
Williams
Fork
Snake
River
DILLON
RESERVOIR
North Fork Ranch Creek
Frisco
Tenmile Creek
Swan
River
Tenmile Creek
French Gulch
Breckinridge
Buffalo Lake
Colo.
Map Location
DILLON RESERVOIR
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Facility
Drainage Area Boundary
Km.
Mi.
Scale

DILLON RESERVOIR

STORET NO. 0806

I. CONCLUSIONS

A. Trophic Condition:

Survey data indicate that Dillon Reservoir is oligotrophic. Total phosphorus ranged from 5 to 22 µg/l, total nitrogen ranged from 220 to 320 µg/l, chlorophyll *a* ranged from 2 to 5 µg/l, and Secchi disc transparencies ranged from 4.6 to 15.2 meters.

Of the 13 Colorado lakes and reservoirs sampled in 1975, Dillon Reservoir ranked first in overall trophic quality when compared using a combination of six parameters*. None of the other water bodies had less median total phosphorus, median dissolved phosphorus (one had the same), and median inorganic nitrogen (six had the same). One of the water bodies had less mean chlorophyll *a*, and none of the others had greater Secchi disc transparency. No significant depression of dissolved oxygen with depth occurred during Survey sampling (the minimum measured was 5.8 mg/l at a depth of 22.9 meters).

Field limnologists did not observe algal concentrations or macrophytes.

B. Rate Limiting Nutrient:

The algal assay results are not considered representative of conditions in the reservoir at the time of sampling due to significant nutrient changes in the sample during shipment from the field to the laboratory. The reservoir data indicate phosphorus

* See Appendix A.

limitation. This conclusion is supported by a previous study on this water body (Anonymous, 1974a).

C. Nutrient Controllability:

1. Point Sources--During the sampling year, point sources contributed 30.6% of the total phosphorus input to Dillon Reservoir. A major portion of this load (22.4%) was contributed by the Frisco Sanitation District (SD) wastewater treatment plant. The plant at Breckenridge contributed 3.5%, the plant at Copper Mountain contributed 1.5%, and six smaller plants collectively contributed 3.0%. Septic tanks serving shoreline residences, parks, and campgrounds contributed an estimated 0.1%.

The phosphorus loading of 0.61 g/m^2 measured during the sampling year is less than that proposed by Vollenweider (Vollenweider and Dillon, 1974) as a eutrophic loading but is greater than his oligotrophic loading (see page 15).

During the sampling year, a number of the wastewater treatment plants in the drainage provided phosphorus removal (see page 11); and at this time, the Summit Cove wastes are treated at the Summit County Phase D plant (with phosphorus removal), construction of phosphorus removal facilities at the Frisco SD plant is scheduled to begin in October, 1977, and the Copper Mountain SD is proposing land disposal of plant effluent (Lang, 1977). Assuming 85% removal at the plants and complete removal by land disposal, it is calculated these improvements will reduce the overall phosphorus loading to 0.48

$g/m^2/yr$. If that loading is not increased, the existing quality of the reservoir should persist. However, in other studies, concern has been expressed regarding the rapid development within the watershed (Anonymous, 1974a), and it has been projected that the full-time residency will more than double between 1980 and 2000 (Anonymous, 1974b).

If the population increases as predicted, water quality in Dillon Reservoir could deteriorate rapidly if phosphorus removal is not provided for the additional wastes. For example, a secondary treatment plant without phosphorus removal serving an additional 4,000 residents could increase the loading from 0.48 to 0.84 $g/m^2/yr$* (a eutrophic level for Dillon Reservoir); with 85% phosphorus removal, the loading would be increased to 0.53 $g/m^2/yr$ (a mesotrophic loading).

2. Non-point sources--Non-point sources, including precipitation, contributed 69.4% of the total phosphorus load during the sampling year. After known point sources were subtracted, Tenmile Creek contributed 32.4%, the Snake River contributed 8.4%, the Blue River contributed 5.9%, Miners Creek contributed 1.1%, and minor tributaries and immediate drainage contributed an estimated 18.7%.

The phosphorus export rate of Tenmile Creek (10 $kg/km^2/yr$) was significantly higher than the rates of the other Dillon Reservoir tributaries (see page 14). This could have been due to additional

* Estimate based on 1.134 kg P/capita/year; see Working Paper No. 175, "...Survey Methods, 1973-1976".

phosphorus sources in the vicinity of Copper Mountain. In a previous report it is noted that the Copper Mountain Ski Area and community presently are under development for a projected population of 25,000 (Anonymous, 1974a). Additional investigation is needed to determine the controllability of phosphorus from that area.

II. RESERVOIR AND DRAINAGE BASIN CHARACTERISTICS†

A. Morphometry††:

1. Surface area: 12.76 kilometers^2.
2. Mean depth: 24.6 meters.
3. Maximum depth: 60.9 meters.
4. Volume: 313.306 x 10^6 m^3.
5. Mean hydraulic retention time: 1.3 years (based on outflow).

B. Tributary and Outlet:
(See Appendix C for flow data)

1. Tributaries -

Name	Drainage area (km^2)*	Mean flow (m^3/sec)*
Blue River	313.4	2.44
Tenmile Creek	240.4	2.63
Miners Creek	17.3	0.27
Snake River	201.0	2.08
Minor tributaries & immediate drainage -	82.7	2.19
Totals	854.8	9.61

2. Outlet -

Harold D. Roberts Tunnel	-	1.24
Blue River	867.6	6.39
Totals	867.6**	7.63

C. Precipitation***:

1. Year of sampling: 30.8 centimeters.
2. Mean annual: 42.6 centimeters.

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† Table of metric conversions--Appendix B.
†† Anderson, 1974.
* For limits of accuracy, see Working Paper No. 175. "...Survey Methods, 1973-1976".
** Includes area of reservoir.
*** See Working Paper No. 175.

III. WATER QUALITY SUMMARY

Dillon Reservoir was sampled two times during the open-water season of 1975 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from a number of depths at four stations on the reservoir (see map, page v). During each visit, a single depth-integrated (4.6 m to surface) sample was composited from the stations for phytoplankton identification and enumeration; and during the first visit, a single 18.9-liter depth-integrated sample was composited for algal assays. Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll a analysis. The maximum depths sampled were 22.9 meters at station 1, 13.4 meters at station 2, 16.8 meters at station 3, and 50.3 meters at station 4.

The sampling results are presented in full in Appendix D and are summarized in the following table.

A. SUMMARY OF PHYSICAL AND CHEMICAL CHARACTERISTICS FOR DILLON RESERVOIR
STORET CODE 0806

PARAMETER	1ST SAMPLING (8/25/75) 4 SITES RANGE	MEAN	MEDIAN	2ND SAMPLING (10/ 9/75) 4 SITES RANGE	MEAN	MEDIAN	3RD SAMPLING (**/**/**) 0 SITES RANGE	MEAN	MEDIAN
TEMP (C)	4.2 - 17.9	10.7	12.4	6.5 - 11.2	10.3	10.8	******	**********	
DISS OXY (MG/L)	6.0 - 7.6	7.0	7.0	5.8 - 8.2	7.6	7.8	******	**********	
CNDCTVY (MCROMO)	82. - 97.	91.	93.	94 - 100	99	100	******	**********	
PH (STAND UNITS)	7.0 - 8.3	7.6	7.6	7.4 - 7.8	7.7	7.7	******	**********	
TOT ALK (MG/L)	39. - 45.	41.	41.	38. - 59.	47.	48.	******	**********	
TOT P (MG/L)	0.005 - 0.017	0.008	0.008	0.006 - 0.022	0.012	0.012	******	**********	
ORTHO P (MG/L)	0.002 - 0.002	0.002	0.002	0.002 - 0.007	0.002	0.002	******	**********	
NO2+NO3 (MG/L)	0.020 - 0.080	0.029	0.020	0.020 - 0.120	0.033	0.020	******	**********	
AMMONIA (MG/L)	0.020 - 0.020	0.020	0.020	0.020 - 0.020	0.020	0.020	******	**********	
KJEL N (MG/L)	0.0 - 0.300	0.200	0.200	0.200 - 0.200	0.200	0.200	******	**********	
INORG N (MG/L)	0.040 - 0.100	0.049	0.040	0.040 - 0.140	0.053	0.040	******	**********	
TOTAL N (MG/L)	0.220 - 0.320	0.241	0.225	0.220 - 0.320	0.233	0.220	******	**********	
CHLRPYL A (UG/L)	2.1 - 2.5	2.3	2.3	2.8 - 4.9	4.0	4.1	******	**********	
SECCHI (METERS)	4.6 - 15.2	7.8	5.8	5.2 - 15.2	8.3	6.4	******	**********	

B. Biological Characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera	Algal Units per ml
08/25/75	1. Flagellates	1,537
	2. Cryptomonas sp.	713
	3. Asterionella sp.	604
	4. Fragilaria sp.	384
	5. Dinobryon sp.	384
	Total	3,622
10/09/75	1. Fragilaria sp.	3,297
	2. Asterionella sp.	1,486
	3. Flagellates	650
	4. Cryptomonas sp.	279
	5. Cysts (?)	232
	Other genera	93
	Total	6,037

2. Chlorophyll a -

Sampling Date	Station Number	Chlorophyll a (µg/l)
08/25/75	1	2.2
	2	2.5
	3	2.1
	4	2.4
10/09/75	1	3.7
	2	4.9
	3	2.8
	4	4.6

C. Limiting Nutrient Study:

The algal assay results are not considered indicative of conditions present in the reservoir at the time the sample was taken (08/25/75) due to nutrient changes in the sample during shipment from the field to the laboratory. However, the reservoir data indicate phosphorus limitation; i.e., the mean inorganic nitrogen to orthophosphorus ratios were 18 to 1 or greater at all sampling stations and times, and phosphorus limitation would be expected.

IV. NUTRIENT LOADINGS
(See Appendix E for data)

For the determination of nutrient loadings, the Colorado National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page v), except for the months of July and August when two samples were collected at most of the sites. Sampling was begun in September, 1974, and was completed in August, 1975.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Colorado District Office of the U.S. Geological Survey for the tributary sites nearest the reservoir.

In this report, nutrient loads for sampled tributaries were determined by using a modification of a U.S. Geological Survey computer program for calculating stream loadings*. Nutrient loads shown are those measured minus point-source loads, if any.

Nutrient loads for unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were estimated using the mean concentrations in Meadow Creek at station B-1 and the mean annual ZZ flow.

The operators of the Breckenridge SD, Copper Mt. SD, Frisco SD, Summit County Phase D, and Summit Cove wastewater treatment plants provided monthly effluent samples and corresponding flow data. The operators of the wastewater treatment plants at Shangri La Inn, McDill-Placer, Blue River SD, and Valley of the Blue provided monthly samples; however, corresponding flow data were not available, and nutrient loads were estimated at 1.134 kg P and 3.401 kg N/capita/year.

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* See Working Paper No. 175.

A. Waste Sources:

1. Known municipal* -

Name	Pop. Served	Treatment	Mean Flow (m^3/d)	Receiving Water
South Blue River SD	10-20	ext. aer.	7.6**	Blue River
McDill-Placer	10-20	ext. aer.	7.6**	Blue River
Shangri-La Inn	25-50	ext. aer. + P-removal	18.9**	Blue River
Valley of the Blue	10-20	ext. aer.	7.6**	Blue River
Breckenridge SD	1,000	P-removal	2,050.3	Blue River
Copper Mt. SD	1,150	P-removal	208.2	Tenmile Creek
Summit Cove (East Dillon SD)	334†	P-removal	126.5	Soda Creek
Frisco SD	1,500	act. sludge	700.6	Miners Creek
Summit County Phase D	1,270†	P-removal	480.7	Snake River

2. Industrial - Mining activities in the drainage, particularly in the Tenmile Creek watershed, are reported to contribute to elevated levels of molybdenum in the reservoir (Anonymous, 1974a). The nutrient significance of the mining operations is not known but is assumed to be minimal.

* Lang, 1974.
** Flow estimate based on 0.3785 m^3/capita/day.
† Population estimate based on flow rate of 0.3785 m^3/capita/day.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	kg P/ yr	% of total
a. Tributaries (non-point load) -		
Blue River	460	5.9
Tenmile Creek	2,520	32.4
Miners Creek	85	1.1
Snake River	655	8.4
b. Minor tributaries & immediate drainage (non-point load) -	1,450	18.7
c. Known municipal STP's -		
South Blue River SD	25	0.3
McDill-Placer	25	0.3
Shangri La Inn	55	0.7
Valley of the Blue	25	0.3
Breckenridge SD	275	3.5
Copper Mt. SD	120	1.5
Summit Cove	55	0.7
Frisco SD	1,740	22.4
Summit Co. Phase D	45	0.6
d. Septic tanks* -	10	0.1
e. Industrial - Unknown	?	-
f. Direct precipitation** -	225	2.9
Total	7,770	100.0

2. Outputs -

Reservoir Outlet - H. D. Roberts Tunnel	365
Blue River	1,860
Total	2,225

3. Net annual P accumulation - 5,545 kg.

* Estimate based on one park and four campgrounds; see Working Paper No. 175.
** See Working Paper No. 175.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source	kg N/ yr	% of total
a. Tributaries (non-point load) -		
Blue River	26,505	12.8
Tenmile Creek	72,710	35.1
Miners Creek	4,595	2.2
Snake River	24,415	11.8
b. Minor tributaries & immediate drainage (non-point load) -	49,310	23.8
c. Known STP's -		
South Blue River SD	70	<0.1
McDill-Placer	70	<0.1
Shangri La Inn	170	0.1
Valley of the Blue	70	<0.1
Breckenridge SD	8,245	4.0
Copper Mt. SD	1,055	0.5
Summit Cove	610	0.3
Frisco SD	3,585	1.7
Summit Co. Phase D	1,760	0.8
d. Septic tanks* -	315	0.2
e. Industrial - Unknown	?	-
f. Direct precipitation** -	13,775	6.6
Total	207,260	100.0

2. Outputs -

Reservoir outlet - H. D. Roberts Tunnel	18,560
Blue River	155,490
Total	174,050

3. Net annual N accumulation - 33,210 kg.

* Estimate based on one park and four campgrounds; see Working Paper No. 175.
** See Working Paper No. 175.

D. Non-Point Nutrient Export by Subdrainage Area:

Tributary	kg P/km²/yr	kg N/km²/yr
Blue River	1	85
Tenmile Creek	10	302
Miners Creek	5	266
Snake River	3	121

E. Mean Nutrient Concentrations in Ungaged Stream:

Tributary	Mean Total P Conc. (mg/l)	Mean Total N Conc. (mg/l)
Meadow Creek	0.021	0.714

F. Yearly Loads:

In the following table, the existing phosphorus loadings are compared to those proposed by Vollenweider (Vollenweider and Dillon, 1974). Essentially, his "dangerous" loading is one at which the receiving water would become eutrophic or remain eutrophic; his "permissible" loading is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic loading would be considered one between "dangerous" and "permissible".

Note that Vollenweider's model may not be applicable to water bodies with short hydraulic retention times.

	Total Phosphorus		Total Nitrogen	
	Total	Accumulated	Total	Accumulated
grams/m^2/yr	0.61	0.43	16.2	2.6

Vollenweider phosphorus loadings ($g/m^2/yr$) based on mean depth and mean hydraulic retention time of Dillon Reservoir:

"Dangerous" (eutrophic loading)	0.84
"Permissible" (oligotrophic loading)	0.42

V. LITERATURE REVIEWED

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Vollenweider, R. A., and P. J. Dillon, 1974. The application of the phosphorus loading concept to eutrophication research. Natl. Res. Council of Canada Publ. No. 13690, Canada Centre for Inland Waters, Burlington, Ontario.

VI. APPENDICES

APPENDIX A

LAKE RANKINGS

ERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P	INDEX NO
801	BARKER RESERVOIR	58 (7)	42 (5)	67 (8)	75 (9)	58 (7)	58 (7)	358
802	BARR LAKE	0 (0)	8 (1)	42 (5)	17 (2)	29 (3)	8 (1)	104
803	BLUE MESA RESERVOIR	75 (9)	87 (9)	75 (9)	42 (5)	8 (1)	67 (8)	354
804	CHERRY CREEK LAKE	42 (5)	87 (9)	33 (4)	33 (4)	46 (5)	50 (6)	291
805	CUCHARAS RESERVOIR	33 (4)	58 (6)	8 (1)	25 (3)	0 (0)	33 (4)	157
806	DILLON RESERVOIR	100 (12)	58 (6)	100 (12)	92 (11)	75 (8)	96 (11)	521
807	GRAND LAKE	83 (10)	87 (9)	92 (11)	83 (10)	29 (3)	79 (9)	453
808	GREEN MOUNTAIN RESERVOIR	92 (11)	58 (6)	83 (10)	58 (7)	92 (11)	96 (11)	479
809	HOLBROOK LAKE	25 (3)	25 (3)	0 (0)	8 (1)	100 (12)	25 (3)	183
810	LAKE MEREDITH	17 (2)	17 (2)	17 (2)	0 (0)	17 (2)	17 (2)	85
811	MILTON RESERVOIR	8 (1)	0 (0)	50 (6)	50 (6)	75 (8)	0 (0)	183
812	NAVAJO RESERVOIR	50 (6)	33 (4)	25 (3)	100 (12)	46 (5)	42 (5)	296
813	SHADOW MOUNTAIN LAKE	67 (8)	87 (9)	58 (7)	67 (8)	75 (8)	79 (9)	433

LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
1	0806	DILLON RESERVOIR	521
2	0808	GREEN MOUNTAIN RESERVOIR	479
3	0807	GRAND LAKE	453
4	0813	SHADOW MOUNTAIN LAKE	433
5	0801	BARKER RESERVOIR	358
6	0803	BLUE MESA RESERVOIR	354
7	0812	NAVAJO RESERVOIR	296
8	0804	CHERRY CREEK LAKE	291
9	0811	MILTON RESERVOIR	183
10	0809	HOLBROOK LAKE	183
11	0805	CUCHARAS RESERVOIR	157
12	0802	BARR LAKE	104
13	0810	LAKE MEREDITH	85

APPENDIX B

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x 8.107×10^{-4} = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 = cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

APPENDIX C

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR COLORADO 02/20/76

LAKE CODE 0806 DILLON

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 865.1

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
0806A1	867.6	2.27	1.98	1.84	2.97	11.33	22.09	13.88	7.08	4.67	3.40	2.55	2.41	6.39
0806A2	313.4	0.74	0.68	0.65	0.99	4.53	8.78	5.10	2.83	1.70	1.42	0.99	0.85	2.44
0806C1	240.4	0.42	0.40	0.41	0.96	7.50	12.46	4.39	1.84	1.13	0.85	0.62	0.48	2.63
0806D1	17.3	0.08	0.08	0.08	0.13	0.57	1.10	0.45	0.23	0.14	0.11	0.11	0.09	0.27
0806F1	201.0	0.45	0.40	0.40	0.68	3.54	9.34	4.53	2.12	1.25	0.91	0.71	0.54	2.08
0806J1	0.0	0.62	0.51	0.54	1.13	0.99	0.37	2.41	4.39	1.84	0.76	0.54	0.68	1.24
0806ZZ	93.2	0.20	17.13	0.20	0.23	1.13	3.40	3.11	0.85	0.40	0.37	0.31	0.23	2.19

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 865.1
SUM OF SUB-DRAINAGE AREAS = 865.3

TOTAL FLOW IN = 131.10
TOTAL FLOW OUT = 76.46

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
0806A1	9	74	2.94	28	2.78				
	10	74	2.89	27	2.92				
	11	74	2.15	24	2.15				
	12	74	1.93	18	1.56				
	1	75	1.95	19	2.15				
	2	75	1.78	23	1.98				
	3	75	1.78	22	1.78				
	5	75	8.30	3	4.36				
	6	75	10.96	12	11.19				
	7	75	18.94	9	22.77	27	15.80		
	8	75	9.74	14	11.38	23	7.36		
0806A2	9	74	1.39	28	1.73				
	10	74	1.25	27	1.13				
	11	74	0.96	24	0.88				
	12	74	0.74	18	0.74				
	1	75	0.59	19	0.59				
	2	75	0.62	22	0.65				
	3	75	0.65	23	0.65				
	5	75	3.40	4	1.05	27	5.44		
	6	75	7.93	13	6.57				
	7	75	8.50	9	11.50	27	5.55		
	8	75	3.11	19	3.34	23	3.00		

TRIBUTARY FLOW INFORMATION FOR COLORADO 02/20/76

LAKE CODE 0806 DILLON

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
0806C1	9	74	0.79	28	0.76				
	10	74	0.68	27	0.62				
	11	74	0.54	24	0.54				
	12	74	0.40	17	0.34				
	1	75	0.37	19	0.42				
	2	75	0.35	22	0.34				
	3	75	0.40	23	0.40				
	5	75	4.53	5	0.91	27	10.28		
	6	75	13.03	13	7.93				
	7	75	12.46	9	18.46	27	4.98		
	8	75	2.41	19	1.87	23	1.87		
0806D1	9	74	0.06	28	0.04				
	10	74	0.06	27	0.05				
	11	74	0.05	24	0.04				
	12	74	0.04	17	0.04				
	1	75	0.04	19	0.04				
	2	75	0.04	22	0.04				
	3	75	0.04	23	0.04				
	5	75	0.16	4	0.09	27	0.21		
	6	75	0.37	13	0.40				
	7	75	0.20	9	0.24	27	0.13		
	8	75	0.09	19	0.08	23	0.08		
0806F1	9	74	0.99	28	0.85				
	10	74	1.25	27	0.88				
	11	74	0.76	24	0.65				
	12	74	0.48	18	0.45				
	1	75	0.42	19	0.42				
	2	75	0.40	23	0.40				
	3	75	0.40	22	0.40				
	5	75	1.98	5	0.99	27	3.82		
	6	75	7.79	13	6.23				
	7	75	7.22	9	10.76	27	3.54		
	8	75	1.98	19	1.84	23	1.70		
0806J1	9	74	1.59	29	1.53				
	10	74	1.10	27	1.27				
	11	74	1.02	24	1.30				
	12	74	1.30	18	1.30				
	1	75	1.27	19	1.22				
	2	75	1.30	23	1.27				
	3	75	0.74	22	0.85				
	5	75	4.42	4	0.0	27	6.40		
	6	75	0.26	13	0.0				
	7	75	2.01	9	2.66	27	0.0		
	8	75	4.62	19	2.61	23	2.66		

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TRIBUTARY FLOW INFORMATION FOR COLORADO 02/20/76

LAKE CODE 0806 DILLON

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
0806ZZ	9	74	0.40						
	10	74	0.37						
	11	74	0.31						
	12	74	0.23						
	1	75	0.20						
	2	75	0.18						
	3	75	0.20						
	5	75	1.13						
	6	75	3.40						
	7	75	3.11						
	8	75	0.85						

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APPENDIX D

PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 76/02/23

080601
39 36 30.0 106 01 22.0 3
DILLON RESERVOIR
08117 COLORADO

11EPALES 2111202
0075 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/08/25	09 20	0000	12.6	7.4	180	97	7.60	40	0.020K	0.200	0.020K	0.002K
	09 20	0005	12.4	7.2		94	7.70	40	0.020K	0.300	0.020K	0.002K
	09 20	0030	10.1	7.0		82	7.40	40	0.020K	0.300	0.020K	0.002K
	09 20	0045	7.5	6.8		85	7.20	39	0.020	0.200	0.040	0.002K
	09 20	0071	6.1	6.6		87	7.20	41	0.020	0.200	0.050	0.002K
75/10/09	14 50	0000	11.2	7.8	252	100	7.40	48	0.020K	0.200K	0.020K	0.002K
	14 50	0005	11.1	8.0			7.60	52	0.020K	0.200K	0.020K	0.002K
	14 50	0023	11.0	8.2		100	7.60	53	0.020K	0.200K	0.020K	0.002K
	14 50	0050	10.4	7.6		100	7.50	59	0.020K	0.200K	0.030	0.002K
	14 50	0075	9.5	6.6		100	7.40	57	0.020K	0.200K	0.050	0.002K

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/08/25	09 20	0000	0.009	2.2	
	09 20	0005	0.009		
	09 20	0030	0.008		
	09 20	0045	0.006		
	09 20	0071	0.006		
75/10/09	14 50	0000	0.016	3.7	
	14 50	0005	0.012		
	14 50	0023	0.011		
	14 50	0050	0.011		
	14 50	0075	0.014		

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/02/23

080602
39 35 00.0 106 03 00.0 3
DILLON RESERVOIR
08117 COLORADO

11EPALES 2111202
0047 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/08/25	09 45	0000	13.4	7.6	204	97	7.55	40	0.020K	0.200	0.020K	0.002K
	09 45	0005	13.2	7.5		97	7.75	40	0.020K	0.200K	0.020K	0.002
	09 45	0020	17.9	7.6		95	7.90	41	0.020K	0.200	0.020K	0.002K
	09 45	0038	8.0	6.0		87	7.55	41	0.020K	0.200K	0.030	0.002K
	09 45	0043	7.7	6.0		87	7.35	41	0.020K	0.200	0.040	0.002K
75/10/09	14 00	0000	11.2	8.2	206	97	7.60	47	0.020K	0.200K	0.020K	0.007
	14 00	0005	11.2	8.0		94	7.75	49	0.020K	0.200	0.020K	0.006
	14 00	0023	10.6	8.0		94	7.80	48	0.020K	0.200K	0.020K	0.003
	14 00	0044	10.3	8.0		94	7.80	48	0.020K	0.200K	0.020K	0.002K

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/08/25	09 45	0000	0.008	2.5	
	09 45	0005	0.010		
	09 45	0020	0.009		
	09 45	0038	0.007		
	09 45	0043	0.008		
75/10/09	14 00	0000	0.013	4.9	
	14 00	0005	0.015		
	14 00	0023	0.012		
	14 00	0044	0.012		

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/02/23

080603
39 35 00.0 106 04 07.0 3
DILLON RESERVOIR
08117 COLORADO

11EPALES 2111202
0044 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/08/25	10 15	0000	13.0	7.2	600L	96	8.35	41	0.020K	0.200K	0.020K	0.002K
	10 15	0005	13.0	7.2		96	8.15	42	0.020K	0.200K	0.020K	0.002K
	10 15	0020	12.4	7.0		94	7.90	41	0.020K	0.200K	0.020K	0.002K
	10 15	0040	8.7	6.2		89	7.60	42	0.020K	0.200K	0.030	0.002K
75/10/09	14 30	0000	11.0	7.8	252	100	7.80	44	0.020K	0.200K	0.020K	0.002
	14 30	0005	10.8	7.8		100	7.80	45	0.020K	0.200	0.020K	0.002
	14 30	0023	10.8	7.8		100	7.70	49	0.020K	0.200K	0.020K	0.002K
	14 30	0055	10.8	8.0		100	7.70	48	0.020K	0.200K	0.020K	0.002K

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/08/25	10 15	0000	0.008	2.1	
	10 15	0005	0.017		
	10 15	0020	0.011		
	10 15	0040	0.009		
75/10/09	14 30	0000	0.022	2.8	
	14 30	0005	0.012		
	14 30	0023	0.013		
	14 30	0055	0.015		

K VALUE KNOWN TO BE
LESS THAN INDICATED

L ACTUAL VALUE IS KNOWN TO BE
GREATER THAN VALUE GIVEN

STORET RETRIEVAL DATE 76/02/23

080604
39 36 22.0 106 03 45.0 3
DILLON RESERVOIR
16043 COLORADO

11EPALES 2111202
0109 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/08/25	10 45	0000	13.0	7.6	252	96	7.80	40	0.020K	0.200K	0.020K	0.002K
	10 45	0005	13.1	7.3		93	7.70	41	0.020K	0.200K	0.020K	0.002K
	10 45	0037	10.4	6.8		84	7.40	40	0.020K	0.000K	0.020K	0.002K
	10 45	0060	6.4	6.8		82	7.20	40	0.020	0.200K	0.050	0.002K
	10 45	0105	4.2	6.9		88	7.00	45	0.020K	0.200K	0.080	0.002K
75/10/09	13 15	0000	11.0	7.8	600L	100	7.80	39	0.020K	0.200K	0.020	0.002K
	13 15	0005	11.0	7.6		100	7.85	38	0.020K	0.200K	0.020K	0.002K
	13 15	0023	10.8	8.0		100	7.85	49	0.020K	0.200K	0.020K	0.002K
	13 15	0045	10.8	7.8		100	7.80	41	0.020K	0.200K	0.020K	0.002K
	13 15	0075	9.8	5.8		100	7.60	43	0.020K	0.200K	0.090	0.002K
	13 15	0120	7.1	6.2		100	7.50	45	0.020K	0.200K	0.120	0.002K
	13 15	0165	6.5	6.6		100	7.60	44	0.020K	0.200K	0.080	0.002K

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/08/25	10 45	0000	0.006	2.4	
	10 45	0005	0.006		
	10 45	0037	0.008		
	10 45	0060	0.006		
	10 45	0105	0.005		
75/10/09	13 15	0000	0.009	4.6	
	13 15	0005	0.011		
	13 15	0023	0.011		
	13 15	0045	0.009		
	13 15	0075	0.007		
	13 15	0120	0.006		
	13 15	0165	0.009		

K VALUE KNOWN TO BE
LESS THAN INDICATED

L ACTUAL VALUE IS KNOWN TO BE
GREATER THAN VALUE GIVEN

APPENDIX E

TRIBUTARY AND WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 76/02/24

0806A1
39 37 20.0 106 03 58.0 4
BLUE RIVER
08 7.5 FRISCO
O/DILLON RESERVOIR
SEC RD BRDG .1 MI N OF DILLON DAM
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/28	13	10	0.160	1.700	0.025	0.005	0.005
74/11/24	11	45	0.120	0.400	0.260	0.005K	0.010K
74/12/18	11	30	0.056	1.000	0.040	0.008	0.010K
75/01/19	10	00	0.056	0.200	0.036	0.005K	0.010K
75/02/23	08	30	0.096	0.500	0.024	0.008K	0.010K
75/03/22	12	40	0.085	0.600	0.015	0.005K	0.010K
75/05/03	09	00	0.125	0.950	0.020	0.005	0.010K
75/06/12	14	00	0.185		0.080	0.900	
75/07/09	15	05	0.035	0.200	0.015	0.005K	0.010K
75/07/27	10	30	0.005	0.600	0.025	0.005	0.130
75/08/14	10	17	0.110	0.500	0.025	0.005K	0.010K
75/08/23	10	22	0.115	0.450	0.010	0.005K	0.010K

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/02/24

0806AZ
39 33 59.0 106 02 57.0 4
BLUE RIVER
08 7.5 FRISCO
T/DILLON RESERVOIR
SWAN MT RD BRDG 3 MI E OF FRISCO
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/28	10 40		0.008	1.000	0.020	0.005K	0.005K
74/11/24	10 00		0.136	0.400	0.045	0.015	0.015
74/12/18	12 00		0.080	0.100K	0.016	0.008K	0.010K
75/01/19	11 00		0.096	0.100K	0.016	0.005K	0.010
75/02/22	10 15		0.128	0.700	0.064	0.008K	0.010K
75/03/23	12 30		0.064	0.600	0.024	0.008	0.010K
75/05/27	14 45		0.070	0.100	0.020	0.005	0.010
75/06/13	11 20		0.025	0.050	0.037	0.005	0.010K
75/07/09	15 42		0.035	0.100	0.025	0.010	0.010K
75/07/27	12 00		0.025	0.500	0.010	0.005K	0.030
75/08/19	08 12		0.065	0.550	0.010	0.005K	0.010K
75/08/23	11 40		0.045	0.350	0.010	0.005K	0.010K

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/02/24

080681
39 35 07.0 106 05 38.0 4
MEADOW CREEK
08 7.5 FRISCO
T/DILLON RESERVOIR
HWY 9 BRDG .7 MI N OF FRISCO
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/28	12	05	0.008	0.600	0.015	0.015	0.020
74/11/24	09	00	0.032	0.500	0.025	0.015	
74/12/17	09	30	0.072	0.500	0.040	0.056	0.056
75/05/04	11	00	0.040	1.500	0.035	0.010	0.020
75/05/27	13	40	0.005	0.250	0.020	0.005	0.020
75/06/13	11	00	0.005	0.050	0.015	0.005	0.010K
75/07/09	16	15	0.005	0.050K	0.015	0.010	0.020
75/07/27	13	30	0.015	1.400	0.015	0.005	
75/08/19	09	55	0.005	1.050	0.015	0.005K	0.010
75/08/23	13	00	0.005	1.050	0.015	0.005K	0.020

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/02/24

0806C1
39 34 37.0 106 05 26.0 4
TENMILE CREEK
08 7.5 FRISCO
T/DILLON RESERVOIR
BNK NEAR UNMPRVD RD .6 MI E OF RT 6 JCT
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/28	11	25	0.104	1.400	0.025	0.005K	0.030
74/11/24	09	15	0.144	0.500	0.020	0.005K	0.010K
74/12/17	10	00	0.192	0.100K	0.024	0.008K	0.010K
75/01/19	10	30	0.224	0.100	0.016	0.005K	0.010K
75/02/22	09	50	0.208	0.300	0.024	0.008K	0.010K
75/03/23	11	00	0.220	0.800	0.010	0.005K	0.010K
75/05/05	11	15	0.155	0.775	0.020	0.005K	0.010K
75/05/27	13	54	0.890	1.600	0.650	0.005K	0.080
75/06/13	11	10	0.055	0.350	0.020	0.005K	0.020
75/07/09	16	00	0.135	0.400	0.075	0.005	0.030
75/07/27	13	00	0.050	0.700	0.060	0.005K	0.050
75/08/19	09	31	0.070	0.850	0.015	0.005K	0.010K
75/08/23	12	30	0.060	0.700	0.015	0.005K	0.010K

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/02/24

080601
39 34 27.0 106 05 20.0 4
MINERS CREEK
08 7.5 FRISCO
T/DILLON RESERVOIR
HWY 9 BRDG .1 MI E OF FRISCO
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/28	10 00		0.024	0.900	0.020	0.005K	0.005K
74/11/24	09 30		0.064	1.100	0.020	0.005K	0.010K
74/12/17	11 00		0.064	0.100K	0.016	0.008K	0.010K
75/01/19	11 20		0.056	0.100K	0.008	0.005K	0.010K
75/02/22	10 30		0.056	1.200	0.024	0.008K	0.020
75/03/23	13 10		0.050	0.150	0.005K	0.005K	0.010K
75/05/04	13 00		0.065	0.350	0.015	0.005K	0.010
75/05/27	14 02		0.015	0.250	0.015	0.005K	0.020
75/06/13	11 30		0.025	0.050K	0.010	0.005K	0.010K
75/07/09	15 55		0.030	0.050	0.010	0.010	0.010
75/07/27	12 50		0.020	1.200	0.015	0.005	0.140
75/08/19	09 21		0.020	0.250	0.005	0.005K	0.010K
75/08/23	12 05		0.015	0.650	0.017	0.005K	0.010K

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/02/24

0806F1
39 36 16.0 106 00 25.0 4
SNAKE RIVER
08 7.5 FRISCO
T/DILLON RESERVOIR
BNK 100 FT N OF UNPVD RD 3.3 M SE DILLON
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/28	13 45		0.072	0.800	0.020	0.005K	0.005K
74/11/24	11 15		0.112	0.500	0.015	0.005K	0.010K
74/12/18	11 00		0.120	0.400	0.024	0.008K	0.010K
75/01/19	09 15		0.120	0.100K	0.016	0.005K	0.010K
75/03/22	11 15		0.120	0.050K	0.005	0.005	0.010
75/05/05	10 00		0.090	0.050	0.015	0.005K	0.010K
75/05/27	14 45		0.065	0.300	0.020	0.005	0.030
75/06/13	10 45		0.075	0.600	0.020	0.005K	0.010K
75/07/09	15 25		0.075	0.050K	0.045	0.010	0.010
75/07/27	11 00		0.080	2.700	0.025	0.005K	0.920
75/08/19	10 57		0.050	0.100	0.005	0.005K	0.010K
75/08/23	11 15		0.040	0.350	0.005	0.005K	0.010K

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/02/24

0806G1
39 40 45.0 106 04 55.0 4
BUSHEE CREEK
08 7.5 DILLON
T/DILLON RESERVOIR
BNK 100 FT OFF UNPRVD RD .8 M ENE HWY 9
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/29	10 30		0.032	0.100K	0.010	0.005K	0.005K
74/11/24	12 30		0.040	0.300	0.005	0.005K	0.010K
74/12/18	12 15		0.040	0.500	0.032	0.016	0.016
75/01/19	12 30		0.040	0.100	0.008	0.005K	0.010K
75/03/22	12 15		0.032	0.600	0.024	0.008K	0.010K
75/05/27	15 55		0.010	0.150	0.015	0.005K	0.010
75/06/12	13 40		0.020	0.050K	0.015	0.005K	0.010K
75/07/27	12 30		0.015	3.400	0.010	0.005K	0.090
75/08/19	12 01		0.005	0.150	0.005K	0.005K	0.010K
75/08/23	15 07		0.010	0.150	0.005K	0.005K	0.010K

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/02/24

0806HI
39 39 00.0 106 01 15.0 4
UNNAMED CREEK
08 7.5 DILLON
T/DILLON RESERVOIR
I70 XING 3 MI NE HWY 9 INTERCHANGE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/29	12 45		0.024	0.100K	0.020	0.005K	0.005K
75/05/04	13 00		0.145	0.450	0.015	0.005K	0.060
75/05/27	16 25		0.025	0.350	0.020	0.005K	0.010K
75/06/12	14 25		0.035	0.050K	0.015	0.005K	0.010K
75/08/23	15 33		0.010	0.100	0.005K	0.005K	0.010K

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/02/24

0806J1
39 37 00.0 106 02 40.0 4
HAROLD D ROBERTS TUNNEL
08 7.5 FRISCO
T/DILLON RESERVOIR
W PORTAL ON SEC RD 1 MI W OF I-6 JCT
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/29	11 30		0.200	0.100K	0.010	0.005K	0.005K
74/11/24	11 05		0.224	0.500	0.025	0.010	0.010K
75/05/27	15 20		0.075	0.150	0.015	0.005K	0.020
75/06/13	10 25		0.090	0.150	0.025	0.005	0.010K
75/07/27	15 35		0.015	1.150	0.010	0.005K	0.030
75/08/23	10 50		0.175	0.150	0.020	0.005K	0.010

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/02/24

0806AA AS0806AA P000015
39 26 30.0 106 02 15.0 4
S. BLUE RIVER
08 7.5 BRECKENRIDGE
T/DILLION RES.
BLUE RIVER
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
75/05/14	11	45	0.400	0.500	0.110	0.050K	0.100K		

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/02/24

0806AB AS0806AB P000015
39 22 50.0 106 03 55.0 4
MCDILL-PLACER
08 7.5 BRECKENRIDGE
T/DILLION RES.
BLUE RIVER
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
75/03/26	10	15	0.123	8.000	0.160	1.040	1.900		
75/04/23	12	10	0.200	3.100	0.180	0.650	1.000		
75/05/14	10	15	0.750	0.500K	0.100	0.120	0.150	0.001	0.001
75/06/14			0.275	0.500	0.037	0.100	0.100K		
75/07/09	11	00	0.075	24.000	0.075	0.095	0.500K		
75/09/04	12	20	0.050	5.200	0.025K	0.433	1.000		

K VALUE KNOWN TO BE
LESS THAN INDICATED

47

STORET RETRIEVAL DATE 76/02/24

0806AC AS0806AC P000040
39 25 00.0 106 02 40.0 4
SHANGRI-LA INN
08 7.5 BRECKENRIDGE
T/DILLION RES.
BLUE RIVER
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
75/01/29	11	00	10.800	34.000	0.270	3.400	6.900	0.004	0.006
75/03/26	11	45	0.021	38.000	13.200	3.680	5.100	0.012	0.012
75/05/14	10	00	0.050	37.500	21.000	7.700	8.900		
75/06/14	11	10	0.050	16.000	5.300	2.600	4.100		
75/07/08	15	30	0.050	24.000	9.500	3.500	5.600		
75/07/09	11	30	0.025	23.000	8.500	3.800	5.200		
75/08/05	10	00	0.025	22.000	4.250	1.950	4.000		
75/09/26	11	00	0.025	8.100	0.230	1.950	2.700		

STORET RETRIEVAL DATE 76/02/24

0806AD AS0806AD P000015
39 24 55.0 106 02 50.0 4
VALLEY OF THE BLUE
08 7.5 BRECKENRIDGE
T/DILLION RES.
BLUE RIVER
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
75/01/29	10 15		0.400	5.800	5.300	5.200	9.100		
75/03/29	10 45		0.080	32.000	9.600	11.600	14.000		
75/05/14	10 45		14.500	4.800	0.230	9.000	9.200		
75/06/14	11 00		11.000	2.100	0.080	4.800	5.000		
75/07/09	11 10		9.800	2.300	0.037	2.400	2.500		
75/09/04	12 00		9.200	3.100	0.060	2.300	2.700		

STORET RETRIEVAL DATE 76/02/24

0806AE P00806AE P001000
39 34 15.0 106 03 00.0 4
BRECKENRIDGE
08 7.5 FRISCO
T/DILLION RES.
BLUE RIVER
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
74/12/31	07	30							
CP(T)-			0.160	22.000	11.500	0.220	1.600	0.795	0.533
74/12/31	16	30							
75/01/31	07	30							
CP(T)-			2.020	8.500	0.164	0.090	0.100K	0.592	0.591
75/01/31	17	30							
75/03/13	15	00	0.080	12.400	12.200	0.072	0.170	0.645	0.610
75/03/31	16	00	0.080	15.000	12.400	0.080K	0.100K	0.686	0.633
75/04/30	08	00							
CP(T)-			0.200	4.400	2.800	0.080	0.100K	0.345	0.403
75/04/30	14	00							
75/05/21	00	00							
CP(T)-			0.350	4.000	2.700	0.050K	0.160	0.645	0.523
75/05/21	06	00							
75/06/11	16	00	0.250	5.100	3.400	0.050K	0.100K	0.610	0.550
75/07/23	08	00							
CP(T)-			0.050	5.400	4.400	0.069	0.100K	0.421	0.490
75/07/23	14	00							

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/02/24

0806CA P00806CA P001150
39 31 00.0 106 08 45.0 4
COPPER MT.
08 7.5 VAIL-PASS
T/DILLION RES.
TENMILE CREEK
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
75/03/18	10	00	10.600	1.000K	0.357	0.200	3.100	0.040	0.070
75/04/15	11	00	1.600	23.000	0.520	0.270	0.360	0.060	0.070
75/05/12	11	00	2.600	3.100	0.078	0.238	0.450	0.060	0.070
75/07/23	11	00	4.700	3.100	1.080	1.200	1.400	0.080	0.090
75/08/05	13	00	10.000	2.100	0.275	0.170	0.340	0.040	0.040
75/08/19	11	00	11.000	0.750	0.160	0.200	0.230	0.030	0.040
75/09/02	10	00	7.500	2.000	0.150	0.175	0.300	0.060	0.040
75/09/16	09	10	15.400	1.800	0.250	0.740	1.100	0.020	0.040
75/10/29	09	35	14.000	4.300	0.560	8.100	9.300	0.030	0.020
75/12/15	11	00	0.150	26.000	14.500	1.720	2.400	0.050	0.070

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/02/24

0806EA AS0806EA P000700
39 34 50.0 106 05 45.0 4
FRISCO
08 7.5 FRISCO
T/DILLION RES.
MINERS CREEK
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
74/12/31	11 00		12.800	2.700	0.660	7.200	7.400	0.125	0.100
CP(T)- 74/12/31	16 00								
75/01/30	11 00		0.160	2.700	6.400	0.210	7.600	0.115	0.120
CP(T)- 75/01/30	16 00								
75/02/28	11 00		13.000	4.100	0.420	5.600	6.200	0.230	0.175
CP(T)- 75/02/28	16 00								
75/03/29	11 00		13.800	1.800	0.520	5.100	5.100	0.275	0.240
CP(T)- 75/03/29	16 00								
75/04/30	11 00		11.500	4.200	0.140	6.400	7.000	0.230	0.225
CP(T)- 75/04/30	16 00								
75/05/21	11 00		9.900	3.600	0.100	5.800	5.800	0.200	0.190
CP(T)- 75/05/21	16 00								
75/06/11	11 00		10.500	2.300	0.460	5.250	5.900	0.185	0.200
CP(T)- 75/06/11	16 00								
75/07/02	11 00		13.000	3.800	0.370	4.300	4.300	0.202	0.196
CP(T)- 75/07/02	16 00								
75/07/23	11 00		10.000	2.000	0.420	7.400	7.800	0.196	0.192
CP(T)- 75/07/23	16 00								
75/08/14	11 00		6.800	4.700	0.460	7.000	7.400	0.235	0.218
CP(T)- 75/08/14	16 00								
75/09/05	11 00		5.300	6.600	0.110	8.100	8.900	0.165	0.186
CP(T)- 75/09/05	16 00								
75/09/24	11 00		11.500	3.600	0.090	8.000	8.400	0.186	0.197
CP(T)- 75/09/24	16 00								

STORET RETRIEVAL DATE 76/02/24

0806EA AS0806EA P000700
39 34 50.0 106 05 45.0 4
FRISCO
08 7.5 FRISCO
T/DILLION RES.
MINERS CREEK
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
75/10/15 CP(T)- 75/10/15	11 00 16 00		13.200	3.600	0.175	8.500	8.700	0.160	0.167

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STORET RETRIEVAL DATE 76/02/24

0806FB P00806FB P001600
39 35 45.0 106 00 40.0 4
SUMMIT CO. Ph.D
08005 7.5 KEYSTONE
T/DILLON RES.
SNAKE RIVER
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
75/01/02	08 30		3.360	11.000	8.600	0.100	0.130	0.100	0.100
CP(T)- 75/01/02	16 00								
75/02/03	08 00		0.560	13.000	6.900	0.090	0.100K	0.150	0.200
CP(T)- 75/02/03	16 00								
75/03/03	08 00		0.160	7.500	0.270	0.095	0.200	0.180	0.180
CP(T)- 75/03/03	15 00								
75/04/08	08 00		2.000	6.000	0.260	0.012	0.220	0.180	0.250
CP(T)- 75/04/08	16 00								
75/04/29	08 30		7.800	4.000	2.800	0.079	0.100	0.175	0.200
CP(T)- 75/04/29	15 30								
75/05/19	08 45		6.300	3.900	2.000	0.072	0.100K	0.160	0.110
CP(T)- 75/05/19	15 30								
75/06/10	09 00		0.400	1.300	0.050K	0.050K	0.100K	0.035	0.040
CP(T)- 75/06/10	16 30								
75/07/01	09 30		1.570	1.400	0.087	0.039	0.150	0.100	0.180
CP(T)- 75/07/01	16 00								
75/08/10	08 00		12.600	3.400	0.810	0.050	0.220	0.075	0.085
CP(T)- 75/08/10	15 00								
75/09/02	09 00		2.500	2.300	0.100	0.100	0.100K	0.070	0.072
CP(T)- 75/09/02	16 00								
75/09/24	09 00		8.400	4.100	0.240	0.038	1.300	0.120	0.130
CP(T)- 75/09/24	15 30								
75/10/15	09 10		5.400	2.800	0.075	0.055	0.190	0.051	0.053
CP(T)- 75/10/15	16 45								

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/02/24

0806FB PD0806FB P001600
39 35 45.0 106 00 40.0 4
SUMMIT CO. Ph.D.
08005 7.5 KEYSTONE
T/DILLON RES.
SNAKE RIVER
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
75/11/02 CP(T)- 75/11/02	09 00 15 45		13.000	2.500	0.260	0.050	0.920	0.036	0.051

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STORET RETRIEVAL DATE 76/02/24

0806XA P00806XA P006000
39 35 45.0 106 00 40.0 4
SUMMIT COVE
08123 7.5 FRISCO
T/DILLION RES.
SODA CREEK
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
75/01/02 CP(T)- 75/01/02	08 30 16 00		0.080	23.500	18.000	2.900	4.300	0.050	
75/02/03 CP(T)- 75/02/03	08 30 16 00		0.240	18.000	8.900	0.061	0.900	0.040	0.040
75/03/03 CP(T)- 75/03/03	08 00 16 00		0.080	13.000	0.130	0.080K	0.100	0.050	0.050
75/04/08 CP(T)- 75/04/08	08 30 15 30		1.840	5.100	0.290	0.009	0.100	0.035	0.050
75/04/29 CP(T)- 75/04/29	08 30 15 30		2.500	3.700	0.050K	0.050K	1.100		
75/05/19			0.700	10.500	3.700	0.050K	0.230	0.018	0.020
75/06/09 CP(T)- 75/06/09	09 30 15 30		3.150	5.400	1.800	0.050K	0.280	0.019	0.020
75/07/01 CP(T)- 75/07/01	09 00 14 30		0.125	9.200	2.400	0.025K	0.170	0.030	0.025
75/08/11 CP(T)- 75/08/11	08 30 15 45		0.100	21.000	6.600	0.065	1.700	0.024	0.020
75/09/03 CP(T)- 75/09/03	09 00 15 30		0.050	6.400	3.000	0.058	1.100	0.032	0.025
75/09/24 CP(T)- 75/09/24	09 00 15 30		0.050	10.500	1.150	0.050	3.500	0.023	0.036
75/10/15 CP(T)- 75/10/15	08 30 14 30		0.200	6.100	4.400	0.100	0.160	0.031	0.036
75/11/02 CP(T)- 75/11/02	09 00 15 00		13.200	1.800	0.275	0.050	0.100K	0.021	0.029

K VALUE KNOWN TO BE
LESS THAN INDICATED

15